

CLAIMS

1. A semiconductor device comprising:
an antenna,
an integrated circuit comprising a thin film transistor,
5 a light-emitting element, and
a light-receiving element,
wherein the light-emitting element and the light-receiving element each have a
layer for conducting photoelectric conversion using a non-single crystal thin film, and
wherein the antenna, the light-emitting element and the light-receiving element
10 are electrically connected to the integrated circuit.
2. A semiconductor device comprising:
an antenna,
an integrated circuit comprising a thin film transistor,
15 a light-emitting element, and
a light-receiving element,
wherein the antenna, the light-emitting element and the light-receiving element
are electrically connected to the integrated circuit, and
wherein the integrated circuit, the light-emitting element and the
20 light-receiving element are formed integrally.
3. A semiconductor device comprising:
an antenna,
an integrated circuit comprising a thin film transistor,
25 a light-emitting element, and
a light-receiving element,
wherein the antenna, the light-emitting element and the light-receiving element
are electrically connected to the integrated circuit, and
wherein the antenna, the integrated circuit, the light-emitting element and the
30 light-receiving element are formed integrally.

4. A semiconductor device comprising:

an integrated circuit,

a light-emitting element, and

5 a light-receiving element,

wherein the integrated circuit comprises a connection terminal, a rectification circuit that generates power supply voltage from an alternating current signal that is input to the connection terminal by an antenna, a demodulation circuit for demodulating a first signal received in the light-receiving element, and a logic circuit that conducts arithmetic operation according to the first signal that is demodulated to generate a second signal,

wherein the light-emitting element can convert the second signal to an optical signal, and

15 wherein the integrated circuit, the light-emitting element and the light-receiving element are formed integrally.

5. A semiconductor device comprising:

an antenna,

an integrated circuit comprising a thin film transistor,

20 a light-emitting element, and

a light-receiving element,

wherein the light-emitting element and the light-receiving element each have a layer for conducting photoelectric conversion using a non-single crystal thin film,

25 wherein the antenna, the light-emitting element and the light-receiving element are electrically connected to the integrated circuit, and

wherein the integrated circuit, the light-emitting element and the light-receiving element are formed over a first substrate and then separated therefrom, and attached to a second substrate.

30 6. A semiconductor device comprising:

an antenna,
an integrated circuit comprising a thin film transistor,
a light-emitting element, and
a light-receiving element,

5 wherein the antenna, the light-emitting element and the light-receiving element
are electrically connected to the integrated circuit, and

 wherein the integrated circuit, the light-emitting element and the
light-receiving element are formed over a first substrate and then separated therefrom,
and attached to a second substrate.

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7. A semiconductor device comprising:

an antenna,
an integrated circuit comprising a thin film transistor,
a light-emitting element, and
15 a light-receiving element,

 wherein the antenna, the light-emitting element and the light-receiving element
are electrically connected to the integrated circuit, and

 wherein the antenna, the integrated circuit, the light-emitting element and the
light-receiving element are formed over a first substrate and then separated therefrom,
20 and attached to a second substrate.

8. A semiconductor device comprising:

an integrated circuit,
a light-emitting element, and
25 a light-receiving element,

 wherein the integrated circuit comprises a connection terminal, a rectification
circuit that generates power supply voltage from an alternating current signal that is
input to the connection terminal by an antenna, a demodulation circuit for demodulating
a first signal received in the light-receiving element, and a logic circuit that conducts
30 arithmetic operation according to the first signal that is demodulated to generate a

second signal,

wherein the light-emitting element can convert the second signal to an optical signal,

wherein the integrated circuit, the light-emitting element and the
5 light-receiving element are formed integrally, and

wherein the integrated circuit, the light-emitting element and the
light-receiving element are formed over a first substrate and then separated therefrom,
and attached to a second substrate.

10 9. A semiconductor device according to any one of Claims 5 to 8, wherein the
first substrate is a glass substrate and the second substrate is a plastic substrate.

10. An IC card comprising:

an antenna,

15 an integrated circuit comprising a thin film transistor,

a light-emitting element, and

a light-receiving element,

wherein the antenna, the light-emitting element and the light-receiving element
are electrically connected to the integrated circuit, and

20 wherein the integrated circuit, the light-emitting element and the
light-receiving element are formed integrally.

11. An IC card according to claim 10, wherein the antenna, the integrated
circuit, the light-emitting element and the light-receiving element are formed integrally.

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12. An IC card comprising:

an integrated circuit,

a light-emitting element, and

a light-receiving element,

30 wherein the integrated circuit comprises a connection terminal, a rectification

circuit that generates power supply voltage from an alternating current signal that is input to the connection terminal by an antenna, a demodulation circuit for demodulating a first signal received in the light-receiving element, and a logic circuit that conducts arithmetic operation according to the first signal that is demodulated to generate a
5 second signal,

wherein the light-emitting element can convert the second signal to an optical signal, and

wherein the integrated circuit, the light-emitting element and the light-receiving element are formed integrally.

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13. An IC card comprising:

an antenna,

an integrated circuit comprising a thin film transistor,

a light-emitting element, and

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a light-receiving element,

wherein the antenna, the light-emitting element and the light-receiving element are electrically connected to the integrated circuit, and

wherein the integrated circuit, the light-emitting element and the light-receiving element are formed over a first substrate and then separated therefrom,

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and attached to a second substrate.

14. An IC card according to claim 13, wherein the antenna, the integrated circuit, the light-emitting element and the light-receiving element are formed over a first substrate and then separated therefrom, and attached to a second substrate.

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15. An IC card according to claim 12, wherein the integrated circuit, the light-emitting element and the light-receiving element are formed over a first substrate and then separated therefrom, and attached to a second substrate.

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16. The IC card according to any one of Claims 13 to 15, wherein the first substrate is a glass substrate and the second substrate is a plastic substrate.